**Abstract**

The invention allows the checking of the internal performance of a cross-connect for optical networks with respect to both signal performance and proper connections. In a network comprising a number of interconnected cross-connect devices a spare output line of each cross-connect device is arranged to monitor the input port used by a connection within the cross-connect device. This output is coupled to a Performance Monitor (PM) which determines the bit-rate, type of signal (protocol), and further determines the integrity of the signal. By comparing the results of connection monitoring between a series of cross-connect stages, it is possible to deduce or infer the behaviour of the equipment involved in the connection.